

EDWARD H. RICHARDSON ASSOCIATES, INC.

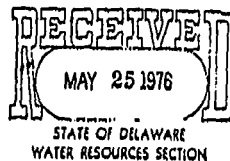
CONSULTING ENGINEERS • LANDSCAPE ARCHITECTS  
PLANNERS • ENVIRONMENTAL SCIENTISTS • SURVEYORS

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COMM. No.: 1233-47-2

APRIL 15, 1976



NEW CASTLE COUNTY  
DEPT. OF PUBLIC WORKS  
2701 CAPITOL TRAIL  
NEWARK, DE 19711

ATTENTION: MR. DAVID CLARK

RE: TYBOUTS CORNER LANDFILL  
INTERIM REPORT No. 6  
GROUNDWATER AND SURFACE WATER MONITORING

GENTLEMEN:

IN ACCORDANCE WITH THE MONITORING PROGRAM, ESTABLISHED FOR THE TYBOUTS CORNER LANDFILL, WE MEASURED GROUNDWATER LEVELS ON MARCH 15, 1976. A TABULAR SUMMARY OF THESE DATA IS ENCLOSED. IN ADDITION TO WATER LEVEL MEASUREMENTS, WATER QUALITY SAMPLES WERE OBTAINED FROM TEN (10) KEY MONITORS FOR THE PURPOSE OF MORE DIRECTLY ASSESSING THE IMPACT OF THE LANDFILL ON THE AREA GROUNDWATER QUALITY. THIS SAMPLING WAS CONDUCTED IN ACCORDANCE WITH THE SEMI-ANNUAL MONITORING PROGRAM, ESTABLISHED IN OUR PROPOSAL OF AUGUST 19, 1975. AS AUTHORIZED IN YOUR LETTER OF MARCH 2, 1976, THREE (3) WATER QUALITY SAMPLES WERE ALSO OBTAINED FROM PIGEON RUN CREEK FOR THE PURPOSE OF ALLOWING BETTER EVALUATION OF THE IMPACT OF THE LANDFILL UPON THIS SURFACE WATER COURSE. THE QUALITY DATA FROM BOTH SAMPLING PROGRAMS ARE PRESENTED ON TABULAR SUMMARIES, ENCLOSED UNDER COVER OF THIS LETTER.

IN GENERAL, THESE DATA INDICATE THE FOLLOWING:

1. WATER LEVELS ARE STILL RISING, ALBEIT AT A POSSIBLE REDUCED RATE, WITHIN THE TRASH FILL AREA. THIS ONGOING RISE INDICATES THAT THE LEACHATE VOLUME AND SOURCE AREA ARE EXPANDING. MEASURES SHOULD BE INSTITUTED TO REVERSE THIS TREND, WITH THE LEAST EXPENSIVE MEASURE BEING TO ATTEMPT A REDUCTION IN THE ON-SITE INFILTRATION OF PRECIPITATION THROUGH A SURFACE GRADING AND REVEGETATION PLAN, SUCH AS THE PROGRAM OUTLINED IN OUR ENGINEERING REPORT OF MARCH, 1975.

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BRIDGEPORT, N.J. • DOVER, DEL. • POCOMOKE CITY, MD. • MEDIA, PA.



APRIL 15, 1976

MR. DAVID CLARK

2. GROUNDWATER QUALITY WITHIN THE FILL AREA IS GROSSLY CONTAMINATED, BUT LITTLE CHANGE IN CONCENTRATION LEVELS HAS BEEN OBSERVED OVER THE PAST TWO (2) YEARS OF RECORD.
3. ALTHOUGH THE GROUNDWATER, OUTSIDE OF LIMITS OF THE TRASH MASS, SHOWS SOME DEGRADATION, THE GROSS LEVELS OF THE CONTAMINANTS HAVE NOT BEEN OBSERVED, AND A RATIO OF COD AND TKN TO THE MORE MOBILE POLLUTANTS, SUCH AS THE CHLORIDE AND NITRATE & NITRITE CATIONS, INDICATES THAT ATTENUATION IN THE SOIL IS ONGOING.
4. PIGEON RUN CREEK WATER IS SOMEWHAT CONTAMINATED. THE DATA INDICATE ONLY MINIMAL FURTHER DEGRADATION IN THE REACH WHICH ABUTS THE LANDFILL SITE. THE DATA ALSO INDICATE LITTLE ALTERATION IN WATER QUALITY OVER THE TWO (2) YEAR PERIOD OF MONITOR RECORD. BASED ON THE QUALITY INFORMATION, FORWARDED WITH YOUR MARCH 1, 1976 MEMORANDUM, THE CREEK WATERS WOULD APPEAR TO BE ONLY SLIGHTLY MORE DEGRADED THAN IN 1968 AND 1969; WHEN THE LANDFILLING OPERATION WAS IN THE INITIAL STAGES.

THESE POINTS ARE DISCUSSED IN MORE DETAIL IN THE FOLLOWING PARAGRAPHS.

COMPARISON OF THE GROUNDWATER LEVEL MEASUREMENTS WITH SIMILAR DATA FROM JANUARY 21, 1976 INDICATES A CONTINUATION OF THE GENERAL TREND TOWARDS INCREASING GROUNDWATER ELEVATION; WITH TWENTY-ONE (21) MONITORS SHOWING A RISE, WHICH AVERAGED APPROXIMATELY 0.3 FEET. COMPARISON OF THE MARCH 15, 1976 DATA WITH SIMILAR DATA FROM MARCH 5, 1975, ALSO INDICATES A CONTINUATION OF THE GENERAL, YEAR LONG, WATER LEVEL RISE NOTED IN THE LAST REPORT. AS SHOWN ON THE FOLLOWING TABLE, CONSIDERABLE VARIATION IN THE YEARLY COMPARISON WAS OBSERVED, WITH INCREASES RANGING TO AS GREAT AS 1.8 FEET (MP-5G) AND DECREASES UP TO 0.7 FEET (MP-8). AGAIN, THE LARGEST INCREASES WERE OBSERVED IN THE EASTERN THIRD (1/3) (AVERAGE 1.4 FEET) AND THE CENTRAL THIRD (1/3) (AVERAGE 0.5 FEET) OF THE FILL AREA. A PORTION OF THIS BUILDUP CAN BE ATTRIBUTED TO THE ABOVE AVERAGE PRECIPITATION OVER THE LAST TWELVE (12) MONTHS (48.34 INCHES FROM MARCH, 1975 THROUGH FEBRUARY, 1976 AT THE WILMINGTON AIRPORT), BUT IT SHOULD BE NOTED THAT THE RISE OUTSIDE THE FILL MASS WAS SIGNIFICANTLY LESS (0.1 TO 0.2 FEET IN THE AREA WEST OF PIGEON RUN CREEK). THIS MARKED BUILDUP IN THE FILL AREA INDICATES THAT THE VOLUME OF SATURATED TRASH AND, AS A RESULT, THE LEACHATE VOLUME AND SOURCE AREA HAVE BEEN GREATLY INCREASED OVER THE PAST YEAR.

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COMM. NO.: 1233-47-2  
MR. DAVID CLARK

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APRIL 15, 1976

MEASURED DIFFERENCES  
WATER LEVEL ELEVATION  
(MARCH 5, 1975 TO MARCH 15, 1976)

<u>MONITOR*</u>	<u>ELEVATION</u>	<u>MONITOR*</u>	<u>ELEVATION</u>	<u>MONITOR*</u>	<u>ELEVATION</u>
P-1	+1.5 FT.	MP-6	-0.1 FT.	MP-18	+0.9 FT.
P-3	+0.1 FT.	MP-7	-0.2 FT.	MP-18A	+0.6 FT.
P-5	-0.1 FT.	MP-8	-0.7 FT.	MP-19	-0.1 FT.
P-6	+1.7 FT.			MP-20	+0.2 FT.
		MP-10	+0.3 FT.	MP-21	-0.2 FT.
MP-1	+1.7 FT.	MP-11	+0.3 FT.	MP-23	+0.3 FT.
MP-2	+0.9 FT.	MP-12	-0.9 FT.	MP-24	+0.2 FT.
MP-3	+0.9 FT.	MP-13	+1.1 FT.		
MP-3A	+0.8 FT.	MP-14	+0.6 FT.	MP-27	+0.6 FT.
MP-4	+1.0 FT.			MP-28	-0.3 FT.
MP-5F	+0.5 FT.	MP-16	+0.3 FT.	MP-29	+0.4 FT.
MP-5G	+1.8 FT.	MP-17	-0.1 FT.	MP-30	-0.2 FT.

\* FOR MONITOR LOCATION SEE "LOCATION PLAN" CONTAINED IN THE  
PHASE II REPORT DATED NOVEMBER 13, 1974.

AS REFERENCED PREVIOUSLY, WATER QUALITY DATA SUMMARIES FOR THE KEY MONITORS ARE ENCLOSED. IT SHOULD BE NOTED THAT MONITOR 5G COULD NOT BE SAMPLED, DUE TO DISTORTIONS OF THE MONITOR PIPE, AND AS INDICATED IN INTERIM REPORT NO. 2, MONITOR 5F WAS SAMPLED IN ORDER TO MORE QUANTITATIVELY EVALUATE THE EFFECTS OF THE LANDFILL UPON THE CONFINED PORTION OF THE UNDERLYING SAND STRATUM, SITUATED NEAR THE TOP OF THE POTOMAC. A REVIEW OF THE DATA RECORDS FOR THE VARIOUS MONITORS INDICATES THE POSSIBILITY OF SOME TIME RELATED TRENDS IN THE TEST PARAMETERS; HOWEVER, MOST OF THE CHANGES IN PARAMETER CONCENTRATIONS APPEAR TO BE RELATED MORE TO RANDOM VARIANCE. AT BEST, THESE TRENDS CAN ONLY BE CHARACTERIZED AS SLIGHT, AND A MORE REALISTIC SUMMARY OF THE DATA IS THAT ESSENTIALLY NO CHANGE HAS OCCURRED IN THE CONCENTRATION LEVELS OVER THE PAST YEAR OF RECORD.

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COMM. NO.: 1233-47-2  
MR. DAVID CLARK

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APRIL 15, 1976

AS AUTHORIZED IN YOUR LETTER OF MARCH 2, 1976, THREE (3) WATER QUALITY SAMPLES WERE OBTAINED FROM PIGEON RUN CREEK AT LOCATIONS CORRESPONDING TO SURFACE SAMPLE STATIONS 1, 5 AND 6, WHICH ARE SHOWN ON THE LOCATION PLAN INCLUDED IN OUR PHASE I REPORT, DATED MARCH 26, 1974; WITH SAMPLE STATION 1 BEING LOCATED AT THE ROUTE 71 BRIDGE, SAMPLE STATION 6 BEING LOCATED AT THE ROUTE 13 BRIDGE, AND SAMPLE STATION 5 BEING LOCATED NEAR THE WOODLAWN GRAVEL SILTING PONDS. THESE DATA INDICATE THE PRESENCE OF SOME CONTAMINANTS IN THE WATER. THE RELATIVE CONCENTRATION OF VARIOUS CONTAMINANTS IN THE PIGEON RUN CREEK WATER INDICATES THAT A PORTION OF THESE POLLUTANTS MUST BE ATTRIBUTED TO SOURCES OTHER THAN THE TYBOUTS CORNER LANDFILL. THIS CONCLUSION, THAT A PORTION OF PIGEON RUN CONTAMINANTS ARE FROM SOURCES SITUATED IN THE HEAD WATER REGION OF PIGEON RUN, IS SUPPORTED BY SIMILAR EVIDENCE GATHERED DURING THE INITIAL MONITORING PROGRAM, PERFORMED BY THE UNIVERSITY OF DELAWARE BETWEEN JANUARY, 1969 AND JUNE, 1971.

WE FEEL THAT THE DATA DISCUSSED IN THE ABOVE PARAGRAPHS SUPPORT OUR PREVIOUSLY CONCLUSIONS WITH REGARD TO THE TYBOUTS CORNER LANDFILL SITE. THERE IS NO DOUBT THAT TYBOUTS CORNER LANDFILL IS GENERATING A RATHER LARGE VOLUME OF LOW GRADE LEACHATE, AT A PROBABLY INCREASING VOLUME RATE AND, AS SUCH, DOES REPRESENT A POTENTIAL ENVIRONMENTAL HAZARD. HOWEVER, THE DATA GATHERED TO DATE DOES NOT APPEAR TO INDICATE AN IMMEDIATE THREAT TO EITHER GROUNDWATER OR SURFACE WATER SUPPLIES. IT IS NOT KNOWN IF THE SUBSURFACE SOILS AT THE SITE CAN CONTINUE TO BE AS EFFECTIVE IN THE ATTENUATION OF THE LEACHATE FLOWING AWAY FROM THE SITE. FOR THESE REASONS, WE FEEL THAT CONTINUED MONITORING OF BOTH GROUNDWATER AND SURFACE WATERS WILL BE REQUIRED FOR SOME INDEFINITE PERIOD OF TIME. AND FOR THESE SAME REASONS, WE FEEL THAT REMEDIAL MEASURES, SUCH AS SITE GRADING AND THE ESTABLISHMENT OF A STABLE VEGETATION COVER, SHOULD BE INSTITUTED IN ORDER TO REDUCE THE AMOUNT OF WATER PERCOLATING THROUGH THE TRASH MASS AND AIDING LEACHATE GENERATION.

WE HAVE TENTATIVELY SCHEDULED THE NEXT GROUNDWATER QUALITY MEASUREMENTS FOR THE MIDDLE OF MAY. IF YOU HAVE ANY QUESTIONS REGARDING THE ABOVE, PLEASE DO NOT HESITATE TO CONTACT US.

VERY TRULY YOURS,

EDWARD H. RICHARDSON ASSOCIATES, INC.

  
GLENN K. ELLIOTT

GKE:DDC

ENCLOSURES

1. WATER LEVEL MEASUREMENT TABLE (2)
2. GROUNDWATER QUALITY TABLES (11)
3. SURFACE WATER QUALITY TABLES (3)

CC: MR. A. W. MADORA  
JAMES F. DUFFIELD, P.E.

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GROUNDWATER ELEVATION  
AT  
TYBOUTS CORNER LANDFILL

MONITOR NUMBER	1-21-76	3-15-76
P-1	39.0 FT.	39.1 FT.
P-2	----- MONITOR DESTROYED -----	
P-3	31.4 FT.	31.3 FT.
P-5	30.5 FT.	30.1 FT.
P-7	40.2 FT.	40.3 FT.
1P-1	40.4 FT.	40.3 FT.
1P-2	36.4 FT.	36.2 FT.
1P-3	33.8 FT.	34.1 FT.
1P-3A	33.8 FT.	34.0 FT.
1P-4	36.8 FT.	36.9 FT.
1P-5F	24.9 FT.	24.5 FT.
1P-5G	39.9 FT.	40.3 FT.
1P-6	6.1 FT.	6.1 FT.
1P-7	28.8 FT.	29.0 FT.
1P-8	24.4 FT.	24.6 FT.
4P-10	27.4 FT.	27.5 FT.
4P-11	32.1 FT.	32.2 FT.
4P-12	36.5 FT.	37.6 FT.
4P-13	25.2 FT.	25.9 FT.
4P-14	30.9 FT.	30.6 FT.
4P-15	----- MONITOR DESTROYED -----	
4P-16	12.1 FT.	12.1 FT.
4P-17	15.2 FT.	15.4 FT.
4P-18	26.9 FT.	27.1 FT.
4P-18A	33.6 FT.	33.1 FT.
4P-19	5.7 FT.	5.8 FT.
4P-20	8.8 FT.	8.8 FT.
4P-21	6.2 FT.	6.3 FT.
4P-23	3.0 FT.	3.1 FT.
4P-24	3.5 FT.	3.5 FT.
MP-26	36.0 FT.	37.3 FT.
MP-27	37.2 FT.	37.4 FT.
MP-28	4.7 FT.	4.8 FT.
MP-29	16.8 FT.	17.0 FT.
MP-30	24.7 FT.	24.4 FT.

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GROUNDWATER ELEVATION  
AT  
TYBOUTS CORNER LANDFILL

MONITOR NUMBER	10-7-74	1-23-75	3-5-75	9-17-75	11-5-75	12-10-75
P-1	37.4 FT.	37.4 FT.	37.6 FT.	38.9 FT.	40.0 FT.	39.2 FT.
P-2	37.7 FT.	---	---	---	---	---
P-3	30.2 FT.	31.0 FT.	31.2 FT.	---	31.0 FT.	31.0 FT.
P-5	29.3 FT.	30.6 FT.	30.2 FT.	30.4 FT.	30.6 FT.	30.4 FT.
P-7	38.6 FT.	38.6 FT.	38.6 FT.	40.8 FT.	39.9 FT.	40.2 FT.
MP-1	38.7 FT.	38.7 FT.	38.6 FT.	40.8 FT.	40.5 FT.	40.3 FT.
MP-2	35.7 FT.	36.0 FT.	35.3 FT.	36.2 FT.	36.1 FT.	36.3 FT.
MP-3	32.0 FT.	33.3 FT.	33.2 FT.	33.5 FT.	33.7 FT.	33.5 FT.
MP-3A	31.9 FT.	33.5 FT.	33.2 FT.	33.4 FT.	33.7 FT.	33.3 FT.
MP-4	34.6 FT.	35.3 FT.	35.9 FT.	36.6 FT.	36.5 FT.	36.4 FT.
MP-5F	22.9 FT.	24.5 FT.	24.0 FT.	24.3 FT.	24.5 FT.	24.5 FT.
MP-5G	38.6 FT.	38.6 FT.	38.5 FT.	40.4 FT.	39.6 FT.	40.0 FT.
MP-6	5.5 FT.	5.4 FT.	6.2 FT.	6.0 FT.	5.3 FT.	5.9 FT.
P-7	27.5 FT.	29.5 FT.	29.2 FT.	28.6 FT.	28.7 FT.	28.5 FT.
MP-8	24.9 FT.	---	25.3 FT.	25.1 FT.	25.0 FT.	24.3 FT.
MP-10	26.2 FT.	27.2 FT.	27.2 FT.	26.7 FT.	27.1 FT.	26.9 FT.
MP-11	30.7 FT.	31.7 FT.	31.9 FT.	31.5 FT.	31.9 FT.	31.7 FT.
MP-12	36.1 FT.	37.0 FT.	36.7 FT.	37.5 FT.	37.3 FT.	37.1 FT.
MP-13	24.2 FT.	26.8 FT.	24.8 FT.	---	24.5 FT.	24.9 FT.
MP-14	29.3 FT.	30.6 FT.	30.1 FT.	29.9 FT.	30.4 FT.	30.2 FT.
MP-15	19.5 FT.	20.7 FT.	20.0 FT.	---	---	---
MP-16	12.0 FT.	12.8 FT.	11.8 FT.	---	12.1 FT.	12.1 FT.
MP-17	15.2 FT.	16.3 FT.	15.5 FT.	15.0 FT.	15.1 FT.	14.9 FT.
MP-18	24.3 FT.	27.4 FT.	26.2 FT.	27.0 FT.	27.1 FT.	26.7 FT.
MP-18A	32.2 FT.	32.8 FT.	32.5 FT.	33.0 FT.	33.3 FT.	33.2 FT.
MP-19	5.8 FT.	6.6 FT.	5.9 FT.	---	5.8 FT.	5.8 FT.
MP-20	8.1 FT.	9.3 FT.	8.6 FT.	---	8.7 FT.	8.4 FT.
MP-21	7.0 FT.	7.1 FT.	6.5 FT.	6.2 FT.	6.3 FT.	6.3 FT.
MP-23	2.3 FT.	2.9 FT.	2.8 FT.	2.5 FT.	2.9 FT.	2.8 FT.
MP-24	3.3 FT.	3.5 FT.	3.3 FT.	3.2 FT.	3.4 FT.	3.4 FT.
MP-27	34.8 FT.	36.0 FT.	36.8 FT.	---	37.2 FT.	36.1 FT.
MP-28	4.6 FT.	5.2 FT.	4.5 FT.	4.5 FT.	4.8 FT.	4.9 FT.
MP-29	16.5 FT.	16.8 FT.	16.6 FT.	16.7 FT.	16.8 FT.	16.8 FT.
MP-30	24.1 FT.	24.8 FT.	24.6 FT.	24.1 FT.	24.2 FT.	24.4 FT.

GROUNDWATER QUALITY - TYBOUT ORNER LANDFILL  
MONITOR NO. 2

	2-5-74	2-18-74	3-5-74	10-24-74	1-29-75	3-6-75	10-7-75	3-15-76
UNITS	5.5	5.5	5.6	5.7	5.7	5.6	5.7	6.7
1 (MG/L)	34000	35000	25500	33500	24500	---	---	---
2, D. (MG/L)	53000	44000	32500	43500	36500	35000	35500	33000
ORIDE (CL) (MG/L)	4200	2500	1750	---	5200	2400	4600	6000
DUCTIVITY FROM HDS/CM	14000	12300	13000	11800	14600	12600	9700	11500
3. KJELDAHL NIT. (K.N.) (MG/L AS N)	1460	790	1100	---	---	1100	700	710
1 + NO <sub>2</sub> (MG/L AS N)	---	---	---	0.12	0.18	0.19	0.14	<0.04
2, D./CL	12.62	17.60	18.57	---	7.02	14.58	7.72	5.50
3. N./NO <sub>3</sub> + NO <sub>2</sub>	---	---	---	---	---	5789	5000	>17750

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000546

	<u>2-5-74</u>	<u>2-18-74</u>	<u>3-5-74</u>	<u>10-24-74</u>	<u>1-75</u>	<u>3-6-75</u>	<u>10-7-75</u>	<u>3-15-76</u>
UNITS)	6.0	5.8	6.8	---	5.8	5.3	6.0	5.4
(MG/L)	22	46	36	---	47	---	---	---
D. (MG/L)	160	16	66	---	69	50	27	20
DRIDE (CL) (MG/L)	120	110	110	---	200	150	160	340
DUCTIVITY ROMHDS/CM)	350	360	420	---	480	420	440	520
KJELDAHL NIT. (N.) (MG/L AS N)	19.6	88	6.14	---	---	2.4	2.63	1.28
+ NO <sub>2</sub> (MG/L AS N)	---	---	---	---	0.16	0.9	0.06	0.79
D./CL	1.33	0.15	0.60	---	0.35	0.33	0.17	0.06
N./NO <sub>3</sub> + NO <sub>2</sub>	---	---	---	---	---	2.7	43.8	1.62

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GROUNDWATER QUALITY - 11500000  
MONITOR POINT NO. 5F

	<u>2-5-74</u>	<u>2-18-74</u>	<u>3-5-74</u>	<u>10-24-74</u>	<u>1-29-75</u>	<u>3-6-75</u>	<u>10-7-75</u>	<u>3-15-76</u>
NITS	6.5	6.6	6.9	---	6.3	---	---	6.6
mg/L	100	<30	95	---	---	---	---	250
mg/L	780	820	430	---	370	---	---	---
RIDE (CL) (MG/L)	25	42	42	---	230	---	---	150
ACTIVITY	200	280	360	430	560	---	---	620
ROMHOS/CM								
KJELDAHL NIT.	46	64	34.4	---	---	---	---	2.65
.N.) (MG/L AS N)								
+ NO <sub>2</sub> (MG/L AS N)	---	---	---	---	0.1	---	---	<0.04
D./CL	31.2	19.5	10.0	---	1.61	---	---	1.67
.N./NO <sub>3</sub> + NO <sub>2</sub>	---	---	---	---	---	---	---	>66.3

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000548

SUMMARY  
GROUNDWATER QUALITY - TYBOUT CORNER LANDFILL  
MONITOR NO. 5G

	<u>2-5-74</u>	<u>2-18-74</u>	<u>3-5-74</u>	<u>10-24-74</u>	<u>1-29-75</u>	<u>3-6-75</u>	<u>10-7-75</u>	<u>3-15-76</u>
INITS)	5.9	6.1	6.2	6.5	6.2	6.2	5.5	---
(MG/L)	3500	9000	8400	15000	16500	---	---	---
D. (MG/L)	4800	9800	11500	18000	23500	26500	39000	---
RIDE (CL) (MG/L)	380	770	700	---	3500	1300	3300	---
ACTIVITY	2500	4200	5000	6900	10000	11300	9000	---
10MHDS/GM)								
KJELDAHL NIT.	148	215	265	---	---	2000	1700	---
.N.) (MG/L AS N)								
± NO <sub>2</sub> (MG/L AS N)	---	---	---	0.15	0.23	0.26	0.82	---
D./CL	12.6	12.72	16.43	---	6.71	20.38	11.82	---
N./NO <sub>3</sub> + NO <sub>2</sub>	---	---	---	---	---	7692	2073	---

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000549

SUMMARY  
GROUNDWATER QUALITY - TYBOL ORNER LANDFILL  
MONITOR NO. 7

	2-5-74	2-18-74	3-5-74	10-24-74	1-29-75	3-6-75	10-7-75	3-15-76
UNITS	6.0	---	5.5	6.3	6.1	6.0	6.0	5.9
(MG/L)	10000	---	23500	13000	17000	---	---	---
D. (MG/L)	11000	---	26500	19000	24500	26000	27500	30200
BRIDE (CL) (MG/L)	500	---	940	---	4000	1300	2700	3500
DUCTIVITY ROMHOS/CM	5600	---	10000	8200	10200	10600	9800	11200
KJELDAHL NIT. ..N.) (MG/L AS N)	426	---	1300	---	---	950	2250	870
+ NO <sub>2</sub> (MG/L AS N)	---	---	---	0.18	0.19	0.18	0.11	<0.04
D./CL	22.00	---	28.19	---	6.13	20.00	10.19	8.63
N./NO <sub>3</sub> + NO <sub>2</sub>	---	---	---	---	---	5278	20455	>21750

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000550

GROUNDWATER QUALITY - TYBOIT CORNER LANDFILL  
MONITOR NO. 10

	2-5-74	2-18-74	3-5-74	10-24-75	1-29-75	3-6-75	10-7-75	3-15-76
UNITS	---	---	---	---	6.9	6.6	7.3	7.1
DO (MG/L)	---	---	---	---	<6	---	---	---
DO (MG/L)	---	---	---	---	27	62	99	100
ORIDE (CL) (MG/L)	---	---	---	---	170	140	130	250
DUCTIVITY FROMPHOS/CM	---	---	---	---	600	630	630	620
KJELDAHL NIT. (N.N.) (MG/L AS N)	---	---	---	---	---	5	9.5	1.63
+ NO <sub>2</sub> (MG/L AS N)	---	---	---	---	<0.04	<0.04	<0.04	<0.04
DO/CL	---	---	---	---	0.16	0.44	0.76	0.40
N./NO <sub>3</sub> + NO <sub>2</sub>	---	---	---	---	---	>125	>238	>40.8

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GROUNDWATER QUALITY - TYBOUTS CORNER LANDFILL  
MONITOR 1

	2-5-74	2-18-74	3-5-74	10-24-74	1-29-75	3-6-75	10-7-75	3-15-76
INITS	--	--	--	--	5.9	6.8	5.5	6.6
(MG/L)	--	--	--	--	1100	--	--	--
D. (MG/L)	--	--	--	--	1400	1300	870	940
RIDE (CL) (MG/L)	--	--	--	--	410	72	130	400
ACTIVITY 30MHOS/CM	--	--	--	--	1360	1390	950	1050
KJELDAHL NIT. N.) (MG/L AS N)	--	--	--	--	--	60	70	18.5
+ NO <sub>2</sub> (MG/L AS N)	--	--	--	--	≤ 0.04	0.05	≤ 0.04	≤ 0.04
D./CL	--	--	--	--	3.41	18.06	6.69	2.35
N./NO <sub>3</sub> + NO <sub>2</sub>	--	--	--	--	--	1200	> 1750	> 463

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GROUNDWATER QUALITY - TYBOUTS TORNEK LANDFILL  
MONITOR # 12

	2-5-74	2-18-74	3-5-74	10-24-74	1-29-75	3-6-75	10-7-75	3-15-76
PH (UNITS)	---	---	---	6.3	6.3	6.1	6.4	5.8
CO <sub>2</sub> (MG/L)	---	---	---	7.1	<6	---	---	---
CHLORIDE (CL) (MG/L)	---	---	---	97	7.7	23	11	56
CONDUCTIVITY (MICROMHOS/CM)	---	---	---	---	740	96	37	64
AMMONIA (MG/L)	---	---	---	300	340	425	260	360
AMMONIUM NIT. (MG/L AS N)	---	---	---	---	---	1.88	0.85	1.58
NITRATE (MG/L AS N)	---	---	---	0.04	< 0.04	< 0.04	0.40	<0.04
NITRATES + NO <sub>2</sub> (MG/L AS N)	---	---	---	---	---	---	---	---
CHLORIDE/CL	---	---	---	---	0.01	0.24	0.30	0.88
NITRATES + NO <sub>3</sub> + NO <sub>2</sub>	---	---	---	---	---	>47	2.1	>39.5

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SUMMARY  
GROUNDWATER QUALITY - TYBOUT RNER LANDFILL  
MONITOR NO. 23

	2-5-74	2-18-74	3-5-74	10-24-74	1-29-75	3-6-75	10-7-75	3-15-76
NITS)	---	---	---	6.1	6.9	6.6	6.5	6.5
(MG/L)	---	---	---	43	13	---	---	---
D. (MG/L)	---	---	---	100	27	35	11	< 5
IDE (CL) (MG/L)	---	---	---	---	115	40	78	170
CTIVITY OMHOS/CM)	---	---	---	230	210	205	250	350
KJELDAHL NIT. N.) (MG/L AS N)	---	---	---	---	---	4.4	2.88	0.83
- NO <sub>2</sub> (MG/L AS N)	---	---	---	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
D./CL	---	---	---	---	0.23	0.88	0.14	0.029
N./NO <sub>3</sub> + NO <sub>2</sub>	---	---	---	---	---	> 110	> 72	> 20.8

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GROUNDWATER QUALITY - TYBOUT CORNER LANDFILL  
MONITOR 27

	2-5-74	2-18-74	3-5-74	10-24-74	1-29-75	3-6-75	10-7-75	3-15-76
UNITS	---	---	---	6.9	7.2	7.3	6.9	7.2
CO <sub>2</sub> (MG/L)	---	---	---	99	33	---	---	---
CHLORIDE (MG/L)	---	---	---	190	150	160	30	12
CHLORIDE (CL) (MG/L)	---	---	---	---	450	20	13	15
DUCTIVITY	---	---	---	230	170	200	120	136
FROMHDS/CM	---	---	---	---	---	6.5	10.5	0.47
PERCENT KJELDAHL NIT.	---	---	---	---	---	---	---	---
PERCENT NIT. (MG/L AS N)	---	---	---	40.04	2.65	0.04	0.05	40.04
+ NO <sub>2</sub> (MG/L AS N)	---	---	---	---	---	---	---	---
PERCENT D./CL	---	---	---	---	53	8.00	2.31	0.80
PERCENT N./NO <sub>3</sub> + NO <sub>2</sub>	---	---	---	---	---	163	210	11.8

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GROUNDWATER QUALITY - TYBOUT  
 MONITOR NO. 28

INNER LANDFILL

	2-5-74	2-18-74	3-5-74	10-24-74	1-29-75	3-6-75	10-7-75	3-15-76
INITS)	---	---	---	6.0	7.1	6.1	6.5	6.3
(MG/L)	---	---	---	37	51	---	---	---
D. (MG/L)	---	---	---	54	42	74	130	20
ORIDE (CL) (MG/L)	---	---	---	---	62	21	34	40
DUCTIVITY	---	---	---	140	220	150	170	158
FROMPHOS/CM)	---	---	---	---	---	4.4	3.0	<0.10
KJELDAHL NIT.	---	---	---	---	---	---	---	---
K.N.) (MG/L AS N)	---	---	---	3.7	0.6	3.8	4.5	3.9
3 + NO <sub>2</sub> (MG/L AS N)	---	---	---	---	---	---	---	---
D. D./CL	---	---	---	---	0.68	3.52	3.82	0.50
K.N./NO <sub>3</sub> + NO <sub>2</sub>	---	---	---	---	---	1.2	0.7	0.026

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GROUNDWATER QUALITY - IYBOUTS CORNER LANDFILL  
SURFACE SAMPLING STATION NO. 1

	2-5-74	2-18-74	3-5-74	10-24-74	1-29-75	3-6-75	10-7-75	3-15-76
UNITS)	6.7	6.5	6.5	---	---	6.8	---	6.5
1 (46/L)	63	41	39	---	---	---	---	---
D. (MG/L)	91	74	70	---	---	58	---	40
ORIDE (CL) (MG/L)	16	21	17	---	---	17	---	30
DUCTIVITY	155	140	190	220	---	215	---	220
ROMHOS/CM)								
KJELDAHL NIT.	3.8	54	4.7	---	---	6.5	---	1.34
..N.) (MG/L AS N)								
+ NO <sub>2</sub> (MG/L AS N)	---	---	---	---	---	5.6	---	3.2
D./CL	5.69	3.52	4.12	---	---	3.41	---	1.33
N./NO <sub>3</sub> + NO <sub>2</sub>	---	---	---	---	---	1.16	---	0.42

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GROUNDWATER QUALITY - TIBBOUTS CONCRETE DAM  
SURFACE SAMPLE COLLECTION NO. 5

	2-5-74	2-18-74	3-5-74	10-24-74	1-29-75	3-6-75	10-7-75	3-15-76
(UNITS)	6.8	6.7	6.8	---	---	---	---	6.8
D (MG/L)	22	13	10	---	---	---	---	---
C.D. (MG/L)	54	47	20	---	---	---	---	60
ORIDE (CL) (MG/L)	17	21	23	---	---	---	---	56
DUCTIVITY CROMHOS/CM	150	160	190	120	---	---	---	240
r. KJELDAHL NIT. K.N.) (MG/L AS N)	2.90	4.0	6.0	---	---	---	---	2.0
3 + NO <sub>2</sub> (MG/L AS N)	---	---	---	---	---	---	---	1.5
C.D./CL	3.18	2.24	0.87	---	---	---	---	1.07
C.N./NO <sub>3</sub> + NO <sub>2</sub>	---	---	---	---	---	---	---	1.33

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